

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. Anne Dougherty on 2/23/2009. The application has been amended as follows:

In line 8 of claim 11, "storing" should read – storage –.

In line 9 of claim 11, "a" should read – said –.

In line 10 of claim 11, "the" should read – a –.

In line 14 of claim 11, "a" should read – said –.

In line 7 of claim 12, "storing" should read – storage –.

In line 8 of claim 12, "a" should read – said –.

In line 9 of claim 12, "the" should read – a –.

In line 10 of claim 17, "a" should read – said –.

In line 11 of claim 17, "the" should read – a –.

Allowable Subject Matter

2. Claims 11-17 are allowed over prior art of record. The following is an examiner's statement of reasons for allowance: Komori et al. (USPN 5956679, already of record) disclose a speech recognition method, device, and computer-readable storage medium for causing a speech recognition device configured to include a computer to perform speech recognition the method causing the speech recognition device to execute the steps of: storing in a storage area a feature quantity acquired from a current speech signal for each frame (sound analysis section 102 in figure 1 inherently includes a buffer memory for temporarily storing the received speech signal for further processing; also referring to col. 5, lines 22-32); reading from a storage area a noise signal acquired immediately prior to the current speech signal to be processed at a current time point to generate noise model data (steps 401-402 in figure 2; noise intervals are extracted from the input speech signal and is processed in step 401 in figure 2; the sound analysis section 102 in figure 1 inherently includes a buffer memory for temporarily storing the noise for further processing by steps 401-402 in figure 2; also referring to col. 5, lines 49-57); processing a speech model stored in a storing portion using a noise adaptation model generation portion for generating noise model data from a noise signal acquired immediately prior to the current speech signal (step 402 in figure 2 generating noise HMM from the noise intervals extracted from the input speech signal); generating a speech model affected by intra-frame echo influence using acoustic model data and an intra-frame characteristic (treated as accessing clean speech models; step 203 in figure 2) common to said current speech signal and said speech signal acquired immediately prior to the current speech signal by steps of transforming cepstrum acoustic model

data into linear spectrum acoustic model data (referring to figure 7) by adding portion to adding cepstrum acoustic model data of said acoustic model and cepstrum acoustic model data of an intra-frame transfer characteristic to generate the affected speech model (*referring to figure 3 or equation 7 on page 129*); adding the noise model data to the affected model data to generate a maximum likelihood echo prediction coefficient (*step 403 in figure 2; adapting speech models using noise model; or referring to the operation of figure 7; adding noise model to the clean speech model to generate adaptive speech models*); and processing said feature quantity, said adapted acoustic model data, and language model data stored in a storing portion to generate a speech recognition result of the current speech signal (*recognition process in steps 303-305 and 104-106 in fig 2*). Komori et al. fail to specifically disclose an “echo speech” in place of noise. However, Takiguchi et al. (already of record) teach “echo speech” (*page 128, left column, “reverberant speech” is considered the same as an “echo speech”*). Both Komori et al. and Takiguchi et al. fail to specifically disclose the step of generating said echo prediction coefficient comprises a step of determining the echo prediction coefficient so that the maximum likelihood is given to at least one phoneme for which the sum value of the linear spectrum echo model data of said speech model affected by intra-frame echo influence and said echo speech model data, which has been generated by said adding portion and stored. Furthermore, it would have not been obvious to one of ordinary skill in the art at the time of invention to modify Komori et al. and/or Takiguchi et al. in order to obtain the claimed invention. Therefore, claims 11-17 are allowed over prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUYEN X. VO whose telephone number is (571)272-7631. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/849,724
Art Unit: 2626

Page 6

Primary Examiner, Art Unit 2626
